transplant for graft failure). Average pre apheresis costs per patient were $1800 (clinic visit, laboratory evaluation, central venous catheter insertion, and chest x-ray to check placement). The average costs of chemotherapy administration, hospitalization, prophylactic antibiotics and G-CSF were $29181 (not including rituximab). This does not include supportive care, I/V fluids, readmission costs or professional fees. Post apheresis costs were $2493.

Conclusions: Interventions or newer agents that reduce the failure rate or the number of apheresis procedures required to reach a target HPC dose without increasing the toxicity may reduce total transplant costs.The financial implication for transplant centers where reimbursement is DRG (diagnosis related group) or case rate based is significant.

Estimated Chemo Mobilization Costs

Cost Item	National Hospital Average Cost (USD)	Median (Range)	Estimated Total Costs (USD)
Daily room charge for chemo administration	$863	6 (3–28)	$5,178
Ifosfamide 3.33 g/m2/d x 3 d	$372.87/gram	19.38g	$7,227
Etoposide 150mg/m2 × 6 d	$17.61/10mg	1,746mg	$3,074
Daily CBC, diff	$93	5 (3–28)	$465
Readmission, daily room charge (n=24)	$863	5 (1–12)	$4,315
Blood transfusions (n=64)	$494	1.4 (0–6)	$692
Platelet transfusions (n=64)	$494	1.5 (0–7)	$741
Oral antibiotics		9 (0–16)	$104
Apheresis procedure	$1,917.73	2 (1–7)	$3,835
PB CD34+ analysis	$135	2 (estimated)	$270
Total (without rituximab)			$36,454

Source: Cleverly and Associates; www.drugstore.com; Redbook™; Thompson PDR.

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SALVAGE AND HEMATOPOIETIC RECOVERY WITH BORTEZOMIB AND MELPHALAN IN CYTOPENIC RECURRENT AND REFRACTORY MULTIPLE MYELOMA

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The management of relapsed and refractory multiple myeloma (RRMM) remains difficult. Patients have short response duration, become cytopenic and are not eligible for clinical trials of promising new drugs. They often have inadequate numbers of stem cells (<3 × 10(6) CD34/kg) remaining for a myeloablative transplant. Thus, new approaches are needed. We therefore initiated a pilot clinical trial to enable the successful reconstitution of blood counts in patients with RRMM so they could proceed onto new clinical trials and test the synergy of bortezomib and melphalan clinically in non-myeloablative doses (stem cell boost). We have treated 9 patients with RRMM who have failed novel agents (including bortezomib) and chemotherapy (dexamethasone, cytoxan, etoposide, cisplatin, and doxil) and who had only limited duration of response previously with high dose melphalan. All patients were cytopenic (ANC < 1000 and/or platelets < 50,000/ mcl) and thus not eligible for new clinical trials. The melphalan was given at 30–50 mg/m2 on days 1 and 4, depending on the age and performance status of the patient. Bortezomib at 1.3 mg/m2 was given on the same days after the melphalan. The patients then received 1.5 to 2.2 × 10(6) CD34 cells/kg. (depending upon the amount of remaining stem cells). We have seen responses (>25%) in all 9, with >PR in 8 and VGPR in 1. More importantly, all patients successfully engrafted WBC >2000 and platelets >50,000/mcl. Duration of response was 2 months or greater and all patients were able to proceed on to new clinical trials. All patients were given treatment as outpatient and average duration of hospitalization was 3 days (range 0 to 6) during cytopenia. Thus, the clinical synergy between bortezomib and melphalan can lead to an effective salvage strategy even for cytopenic patients with relapsed and refractory multiple myeloma. This non-myeloablative approach could serve as a platform for proceeding on to new clinical trials for those advanced patients without adequate numbers of stem cells for a -myeloablative transplant.

PEDIATRIC DISORDERS

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OUTCOMES OF UNRELATED UMBILICAL CORD BLOOD TRANSPLANTATION IN PEDIATRIC PATIENTS WITH PRIMARY AND SECONDARY MYELODYSPLASTIC SYNDROMES

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Myelodysplastic syndromes (MDS) respond poorly to chemotherapy alone. Between 1995 and 2006, 23 pediatric patients with MDS were transplanted with unrelated donor umbilical cord blood (UCB) at our center. The median age was 11.09 yrs (range 1.11–19.73); 20% of patients were male; median time from diagnosis to transplant was 6.57 mo (range 2.00–61.37). Patients were followed for a median of 5.3 yrs (range 1.64–12.36) post-transplant. MDS stage was RA/RC 12 pts, RAEB 8 pts and RAEB-T 3 pts; 78.3% pts had primary MDS. Monosomy 7 was present in 17(74%) of patients. Patients with frank AML were excluded. Preparative regimen was TBI based in 18 (78%) pts and melphalan was used in 14 (61%) of patients. GVHD prophylaxis consisted of CSA/steroids (19 pts) and CSA/MMF (4 pts). Grafts were HLA matched at Class I (A and B) at low resolution and Class II (DRB1) at the allelic level resulting in 16(70%) 4/6 and 7(30%) 5/6 matched transplants. The grafts contained a median of 4.04×10^7 (range 1.68–12.58) total nucleated cells (TNC)/kg pre-cryopreservation; 3.58×10^7 (range 1.01–12.00) TNC/kg and 1.72×10^5 (range 0.17–28.46) CD34+ cells/kg were infused. Cumulative incidence of neutrophil engraftment (ANC>500/μL) at days 42 & 100 was 73.9% (95% CI 55.1%–92.7%) and 91.3% (95% CI 71.3%–100%), and that of platelet engraftment (50K) at 180 days was 69.6% (49.8%–89.4%). Three pts had graft failure while 3 pts (13%) engrafted slowly (after Day 42), perhaps related to some underlying marrow dysfunction caused by MDS. Three patients developed acute GvHD grades II-IV with a cumulative incidence at 100 Days of 13% (95% CI 0.0%–27.1.0%). Four patients relapsed with a CI of relapse at 3 yrs of 13.0% (95% CI 0.0%–27.1%). Cumulative incidence of non-relapse mortality at 1 yr was 27% (95% CI 8.0%–46.0%). Ten pts died: 3 graft failure, 4 relapse, 2 infections (1 adenovirus, 1 toxoplasmosis), and 1 EBV LPD. Overall survival probability at 1 and 3 years were 69.6% (95% CI 46.6%–84.2%) and 59.2% (95% CI 35.9%–76.5%) respectively. Event-free survival (EFS) probabilities at 1 and 3 years were 69.6% (95% CI 46.6%–84.2%) and 60.9% (38.3%–77.4%) respectively. Factors associated with better EFS were age ≤ 10 yrs ($p = 0.05$) and weight ≤ 38 kg ($p = 0.03$). These results, especially in younger pts with Monosomy 7 and MDS, are equivalent to published matched allogeneic bone marrow data. UCB should be actively considered for pediatric MDS pts lacking matched related or unrelated adult donors.

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A PHASE I/II STUDY OF CYCLOPHOSPHAMIDE AND TOPOTECAN IN PATIENTS WITH HIGH-RISK MALIGNANCIES UNDERGOING AUTOLOGOUS HEMATOPOIETIC STEM CELL TRANSPLANTATION: THE ST. JUDE LONG-TERM FOLLOW-UP

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